

Name _____

Final Study Guide CP Chem **(He who suffers, remembers)**

Balance the following equations and indicate their reaction type.



What is Avogadro's number and what does it mean?

Convert the following amounts using a periodic table when applicable. Show all work with units.

5.0 mol Na = _____?_____ atoms Na

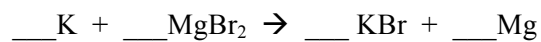
6.2 mol $\text{CuCl}_2 =$ _____?_____ formula units CuCl_2

1.2×10^{24} molecules $\text{CO}_2 =$ _____?_____ mol CO_2

6.2 mol $\text{CuCl}_2 =$ _____?_____ g CuCl_2

1.2 g $\text{CO}_2 =$ _____?_____ mol CO_2

Use the reaction below to answer the following questions.



If 2.0 mol of K are used, how many mol of Mg are produced?



When 26.0 g of KCl are produced, how many moles of oxygen are also yielded?

When 1.20 moles of KClO_3 decompose how many grams of KCl are made?

When 16.0 g of oxygen are produced, how many grams of KCl are also yielded?

What four variables are we studying when we talk about gases?

What is an ideal gas?

What are the 5 points of the kinetic molecular theory?

List and describe the 5 major properties of gases.

Describe how the following variables of gases are related to each other. Make sure to explain why in your answer.

V and T @ constant P and moles

V and P @ constant T and moles

P and T @ constant V and moles

V and moles @ constant P and T

P and moles @ constant V and T

Convert the following pressures. Show all your work with units.

600 mm Hg= ____?____ atm

1.20 atm= ____?____ kPa

What is STP? What are the values for it?

If a gas with a temperature of 300K and a volume 1.2 L has its volume decreased to 0.95L, what is the new temperature of the gas?

If a 500 mL sample of oxygen has a temperature of 20.0°C, and temperature is changed to 15°C, what is the new volume of the gas?

If a 500 mL sample of oxygen has a pressure of 1.5 atm, and pressure changed to 0.50 atm, what is the new volume of the gas?

If 10 mL of methane gas has a pressure of 159 kPa, what is the new volume when the pressure changes to standard pressure?

What is the molar volume of a gas at STP?

How much volume does 12.2 mol of O₂ occupy at STP?

How many moles of neon occupy 12 L 50°C and 0.884 atm?

What is the pressure that 13.0 g of CH₄ gas exerts at a volume of 13.4 L at 732 mm Hg and 30°C?

What weather would you expect with high and low air pressures. Why?

Define the following terms.

Mixture-

Saturated-

Solution-

Unsaturated-

Solubility-

Supersaturated-

Solvent-

Solute-

Use the solubility curve on the handout I gave you to answer the following questions:

What is the solubility of potassium nitrate in 100 grams of water at 80°C ? _____

What is the solubility of sodium chloride in 100 grams of water at 90°C ? _____

What is the minimum temperature needed to dissolve 35 grams of potassium chloride in 100 grams of water? _____

If 250 grams of potassium nitrate are mixed with 100 grams of water at 85°C, how much will *not* dissolve? _____

How much potassium nitrate will dissolve in *50 grams of water* at 95°C? _____

An amount of 100 grams of water at 90°C are saturated with potassium chloride. If this solution is cooled to 35°C, how much of the solid will precipitate? _____

How does solubility differ between gases and solids according to temperature?

How does pressure on a gas affect solubility of that gas? Give an example.

What is the molarity of 200. g of calcium nitrate dissolved in water to make 4.10 L of solution?

A lab requires 500. mL of 2.10 M sodium hydroxide. What mass of sodium hydroxide should be massed out to make this solution?

How many milligrams of caffeine would be a lethal dose for a 65 kg adult? LD_{50} Caffeine = 140 mg/kg

What are the characteristics of an acid?

What are the characteristics of bases?

What does pH measure? What is the pH and pOH of a 0.010 M HCl Solution?

What is the pH of a solution of 0.00034M NaOH?

If 23.0 mL of 0.20M HCl is titrated with 46.0 mL of NaOH solution. What is the concentration of the NaOH?